# looking ahead

. . . . . A monthly report by the National Planning Association on forward-looking policy planning and research — announced, underway and completed — of importance to the nation's future

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## Atomic Energy for Nonmilitary Purposes

### A New NPA Research Project

**by H. Christian Sonne** *Chairman, NPA Board of Trustees*

RARELY in history has man been able to predict what far-reaching effects a new invention may have on society. Changes stemming from such inventions as the wheel, compass, gunpowder, printing press, and telephone were unforeseeable at the time.

With the advent of atomic energy, however, the whole world was alerted to its potentialities for war—but has not awakened as yet to the full implications of its peacetime use. We now have a priceless opportunity to investigate this new field. Fortunately, we have arrived at the stage of technical development where we can begin to recognize and assess some of the profound meaning this new-found knowledge may carry. From atomic energy—with the fission process providing heat, radiation, isotopes, and fission products—should emerge fundamental changes in the manner of man's living, and perhaps dying.

Notwithstanding its obvious promise, the nonmilitary use of atomic energy has become a major problem of public and national policy, in part because we have been necessarily preoccupied with its military and national security aspects. How can it be applied to man's welfare in keeping with his individual needs and his democratic institutions and traditions? The magnitude of the problem is well expressed in the observation that when the history of our age is written it will be apparent that more difficulties had to be overcome in learning how to use atomic energy constructively than in inventing it.

In this setting it is unfortunate that many of us are finding it difficult to avoid becoming confused by the many divergent opinions of the experts often too zealously held, and by the conflicting facts often too carelessly dispersed. Here are several cases of striking divergencies in views to illustrate the nature of this problem:

We hear optimists pressing proposals for early and widespread application of nuclear power in underdeveloped countries, for

### 20th Anniversary Meeting

NPA's annual meeting will take place this December 13-14 in Washington with Board, Agriculture, Business, Labor, and International Committee members joining to explore key problems facing our country today.

During the two-day meeting which is to be held at the Hotel Statler, there will be presented NPA's Gold Medal award for outstanding contributions through planning to the betterment of human life and Certificates of Extraordinary Achievement for distinguished and devoted service to the work of NPA.

example, Latin America. Some experts believe that before long nuclear power may help in converting deserts into fertile land. Yet the sceptics hold to the view that nuclear power still remains too costly for purposes of irrigation, and has really little to offer underdeveloped economies.

Certain technical experts tell the public that nuclear power may not cost less than conventional power and that the economic consequences may be small. Yet, recently an authority stated that our children may be expected to enjoy electric energy in their homes at a cost so low that metering will be unnecessary, and that from the development of atomic energy may come "revolutionary social and economic changes."

Persons with knowledge report that because our domestic energy resources (coal, oil, gas, and hydroelectric sites) are being used up so rapidly we must in the national interest soon turn to alternative sources of energy, particularly nuclear fuels, to alleviate the pressure of rising costs and diminishing supplies. But others, also with experience and knowledge, conclude that nuclear fuel is merely a temporary expedient and that we must press toward the use of solar energy.

There are some who expect that under the new Atomic Energy Act industry will proceed to push this new technology just as aggressively as it has developed others. Some, however, feel that the Federal atomic development program must be expanded if we are to achieve economic nuclear power soon and, indeed, that the industry cannot proceed successfully without most extensive Federal cooperation.

Finally, and perhaps most baffling, we recall the extended debate in the Congress on key provisions of the new Atomic Energy Act. Contentious questions of patents and cross licensing, ownership of fissionable materials and production facilities, sale of by-product power, preference to publicly owned systems, and many others were warmly contested by those holding opposing views.

WHILE the Act has been passed, there are still many problems to be solved before the domestic or international programs can start. Some of the provisions are of limited duration and may be reopened for debate (patents). There are also gaps in national policy; for example, the Act provides no authority to permit the Executive Branch to enter into an international arrangement or "pool" on the lines advanced by the President last December and, more recently, by the Secretary of State.

Now, what is the present lesson of these numerous instances of conflicting facts and divergent opinions? This failure to achieve consensus seems to stem from a lack of objective evaluation of available facts; from the need for applying imagination to novel and inherently difficult situations; and from attitudes which hinder achieving a workable middle ground of cooperation.

The lesson, simply stated, is that we need —and have not had—wholly objective research to lay the groundwork for sound recommendations on public policy. We in NPA, therefore, feel challenged and look forward to our new project begun last month, with a grant of $200,000 from Resources for the Future, Inc., to explore the economic aspects of the nonmilitary uses of atomic energy.

THE NPA project will concentrate on five major topics. These are, with tentative questions for consideration, as follows:

- The National Interest - How important is it to get on with the use of nuclear fuels? What is the role of nuclear fuels in relation to conventional sources of energy—coal, oil, gas, water? What kind of nuclear reactor—package, mobile, or central station—is best fitted for different types of energy requirements?

- The Interests of U.S. Regions - Can the difficulties of regions encountering electric energy supply problems—New England and the Pacific Northwest, for example—be alleviated by the development of nuclear power?

- Industry's Interests - What are the anticipations and needs for atomic energy of such industries as the public and private utilities, equipment manufacturers, the electro-process power-intensive industries?

- Government-Business Relationships - What are the respective roles of Government and business in various stages of technical development—research, pilot plant, full-scale construction and operation of nuclear power reactors?

- International Needs and Problems - What are the potential economic effects of nuclear power abroad—in selected countries, including underdeveloped and industrial areas? What

methods of cooperation among nations and international organizations will be most effective?

Ralph J. Watkins, Director of Research for Dun and Bradstreet, Inc., will be Chairman of a Special Policy Committee for the project to be composed of about twenty leaders from business, labor, agriculture, education, and science. Philip Mullenbach, formerly economist for the Atomic Energy Commission, is Research Director. The staff has already been assembled at Washington headquarters. ◄◄

### Industrial Pensions

By 1960 an estimated 22 million workers probably will be covered by industrial pension plans – with the plans contributing about $6 billion to the annual flow of savings available for investments. These forecasts are made in a new Brookings Institution report which explains the rapid expansion in the number of workers covered by industrial pensions and examines the principal types of pensions now in use. In discussing the basic economic and social problems created by widespread industrial pensioning, the report draws many conclusions about the capacity of present plans to provide old-age security for industrial workers on terms that are fair to the industrial employee, management, and the public. ("Industrial Pensions." From: The Brookings Institution, 722 Jackson Pl., Wash. 6. 1954. 310 pp. $4)

### Road to Recovery

Warm appreciation for American financial and technical aid is expressed by the Dutch Government in "Road to Recovery," a new report surveying the impact of the Marshall Plan on the Netherlands and its contribution to European cooperation. Written by Dutch officials who were responsible for implementing the Marshall Plan in their country, the report vividly portrays the U.S. economic cooperation program as an "indispensable stimulus" in the revival of Dutch industry, agriculture, and foreign trade. American influence was particularly felt in the development of productivity consciousness among the Dutch people. With the help of U.S. funds, a National Productivity Center was established to develop popular support for the concept of increased productivity and to provide the know-how for attaining it.

The friendly yet hardheaded cooperation between the U.S. and the Netherlands in working out the high policy decisions and everyday routine required by the Marshall Plan operations did much to foster a realistic understanding of mutual problems. A similar kind of cooperation has grown up among the countries participating in the Organization for European Economic Cooperation. It is the authors' belief that this experience of give and take may furnish the base for the further integration of Free Europe. ("Road to Recovery." 1954. 212 pp. Limited quantities are available from NPA.)

## — the people of NPA —

**Donald R. Murphy**

NPA Vice Chairman Donald R. Murphy, editor of Iowa's semi-monthly farm paper, "Wallaces' Farmer and Iowa Homestead," serves as Chairman of NPA's Agriculture Committee and as a member of its Steering Committee. He is recognized by his colleagues as a farm poll expert and has developed a number of his own polling techniques—his polls, on large and small issues, keep him in close touch with farmers and their interests. His range of interests includes music and he has a large record collection. Born and reared in Iowa, Mr. Murphy gained practical experience in farming in Oregon and attended Oregon State Agricultural College. After two years of Army service in World War I he returned to his hometown, Des Moines, Iowa, where he went to work for "Wallaces' Farmer" in 1919. He has been editor of the paper since 1933. He was a charter member of NPA's Agriculture Committee. As Committee Chairman (since 1947) he emphasizes the importance of the long-range outlook for farm productivity in relation to consumer demand... and believes the Agriculture Committee is most useful when it works with labor and business on problems common to all three.

# Automation—New Impact and Challenge

by Ted F. Silvey

*National CIO Headquarters Staff; Member, NPA Labor Committee*

FREQUENT reference is seen nowadays in the trade and general magazines to a new concept called "automation." Those who greet the word casually may believe it describes only a different mechanical technique in mass production industry. Actually, it is a new system for planning and control of raw material, manufacturing processes, inspection and packaging by mechanisms which make production workmen unnecessary. Automation introduces a new kind of control which electronically and mechanically accomplishes what heretofore has been done by the operator's intelligence and judgment.

Generally, until about 1950, manufacturing processes required operators to control machines to produce the desired end item. Now, with automation, some machines are designed, through the addition of electronic or other devices, to perform these manipulations themselves at the proper time, in the specified sequence, and with the required judgment. The operators disappear from the scene and a machine engineer or serviceman takes their places—to set the machines properly for automatic production and to check the dials for trouble signals.

The principle of automation may be illustrated by the well-known fact that during darkness in the daytime, caused by a storm or by an eclipse of the sun, chickens and other barnyard fowl will go to roost just as they do in the evening when dusk falls. Whether the chickens exercise instinct or intelligence, an internal change occurs from external influences. A judgment has been made by the chicken that it is time to go to roost. So with automation. An electronic switch pre-set to be sensitive to the intensity of natural light will go on or off as the amount of natural light decreases or increases. Such an electronic switch exercises the intelligence that a workman would exercise when his eyes signal to his brain that there is not enough light to see adequately and he reaches over manually and turns on the light switch.

CLOSED-LOOP control is another way of referring to automation. It functions through "servo-mechanisms," which are usually electronic devices that carry the directions of instruments, film, punch cards, or tape, into the producing machine, automatically ensuring the number, dimensions, and quality of the end product—and, most important, automatically correcting errors that might develop in the process.

The human brain and nervous system is the highest manifestation of the closed-loop control system. A man with a suitcase hurrying to get a train in a railroad station walks or runs through crowded passageways, twisting, turning, and adjusting to avoid colliding with a woman and baby, a fat man with an umbrella, or a porter with a baggage truck. The human closed-loop mechanism, by continually making needed adjustments and corrections to meet changing situations, enables the man to reach his destination.

Another quality of automation is a counterpart of the human ability to retain information in memory until it is needed, and then to put it to use. One simple example of this is a recent development of the automatic dial telephone system in a plant. A user dialing a number and finding it busy heretofore would have had to wait and dial it over and over again until he found the number being called free. But with automation, the user dialing a number and finding it busy can wait with assurance that the instrument will keep in memory the number being called and will ring it when the line is clear.

Fully automatic elevators which are being installed in 80 to 90 percent of new office buildings are another illustration of the memory function. These are not "self-service" elevators; they operate by a central electronic "brain" which instructs the cars to go first to the floors where the largest number of passengers are waiting. This information is conveyed by the push-button signals at each floor.

But the real importance of an instrument that remembers is not found in such simple devices. In a factory a long series of operations can be handled in turn by stored-up directions, released and applied when the sequence of manufacture calls for it. This is called the "system approach" to control—a whole network of instruments and regulators.

Automation is the continuous and integrated operation of a production system without human operators. An essential feature

is that materials handling is an integral part of the system. There is a substitution of energy in mechanical application for both human muscles and human perceptive senses.

In the present early application of automation to factories, manpower is substantially reduced, not completely eliminated. Currently, it is too costly for most factories to go the limit. The necessary instruments and mechanisms could be made, but at a cost so great it is not profitable to displace all production workers right away.

A great many applications already have been perfected. Technical and trade literature is full of examples in many fields—oil refining, chemical processing, electronic component making, meat packing, bakery production, candy manufacture, and metal founding, cutting, and forming. Some of the first applications have to do with office work, particularly that of a routine nature performed by clerks and accountants. Operations like payroll, inventory control, bookkeeping, and accounting, are particularly vulnerable to replacement of human operators with automation.

GENERALLY, automation is referred to as the second industrial revolution, but some students of the subject call it a third, insisting that after the first industrial revolution which began about 1730 there was a second one beginning in the early 1900's. This one was the management rationalization of industry which permitted mass production to be developed; in fact, it is asserted that the second industrial revolution is the basis for automation.

AS THE FIRST industrial revolution applied energy sources other than human and animal muscle power to machinery, so the second revolution broke down manufacturing processes into small units so machinery could automatically perform the processes. Human skills were reduced, but human intelligence and judgment still had to be applied. The revolution that is automation makes unnecessary the application of intelligence and judgment of a human operator, once the engineer or skilled workman has set up the instrument control of the handling and fabricating machinery.

The economic aspects of automation are far-reaching and will make even more true than in the past the fact that machines will be able to do almost everything except buy what they make. Under the American private enterprise system, workers will have to have increasing amounts of money in their pockets all through the year in order to keep the automatic cash registers ringing! ◄◄

## A Handbook for Business Forecasters

"Good business management requires careful planning ahead....First, the businessman must forecast and then he can make his plans." This recognition of the practical need for forecasting—one might almost say the unavoidability of forecasting—is the keynote of a new book on "Determining the Business Outlook," which consists of 19 separate essays by experts in business, finance, and Government, on forecasting tools and how they are used.

Among the forecaster's most necessary tools are the economic statistics provided by government agencies, trade associations, and private research organizations. The book is mainly devoted to clarifying the meanings, uses, and limitations of various of these statistical series. For instance, the Commerce Department's national income statistics are discussed in language familiar to business executives and the Federal Reserve Board's financial statistics are described and interpreted in a similarly lucid fashion.

In a number of the essays the emphasis is on the forecasting procedures and statistical data found most useful in specific industries. For the most part these are written by the chief economists of major business concerns such as Ford Motor Co.; R. H. Macy and Co. Inc.; and U. S. Steel Co. (From: Harper & Bros., 49 E. 33 St., N. Y. 16. 1954. 445 pp. $6.50)

## Beginning Farmers

A report of the NPA Agriculture Committee on the economic problems of beginning farmers was released on August 30. The major needs of these young farmers, according to the report, are for more adequate intermediate credit, rather than for just short-term or mortgage credit, and for better training in management of farms. The Committee urges that private banks and public lending agencies redirect their lending activities by giving more attention to the financial needs of beginning farmers. It also recommends that private and public farm advisory services provide more effective educational assistance in management techniques to beginning farm families, with emphasis placed on self-help. ("Beginning Farmers—A Vulnerable Group in Amer-

ican Agriculture" by Robert K. Buck. PP—88. From: NPA. Aug. 1954. 30 pp. 50¢—free to NPA members.)

## — through the Looking Ahead glass —

### International Television

AN ESTIMATED audience of 90 million Europeans saw and heard Pope Pius this summer as the Supreme Pontiff inaugurated Eurovision—the popular name for what may be the start of a West European television network. Forty-four transmitters and 80 relay stations, one 10,000 feet up in the Swiss Alps, formed an eight-nation hookup which during the six weeks' experimental period brought television viewers the thrills and pageantry of Europe's outstanding sports, cultural, and national events.

France's Grand Prix horse race, a Belgian ballet pantomime, Queen Elizabeth reviewing the Naval Reserve, the Arc de Triomphe by night, and a tour of St. Peter's Basilica were highspots in the experiment, which overcame the technical, political, and financial difficulties of telecasting in six languages over three basically different television systems.

In the not too distant future transoceanic television also may pass beyond the drawing board stage. As a report of the Senate Foreign Relations Committee points out, "The day of worldwide television, from an engineering standpoint, is fast approaching." "It is now possible," says the Committee, "to construct regional telecommunications networks" linking the United States and other North Atlantic countries; the U.S. and Latin America; the western Pacific; southern and southeast Asia; and countries of the Mediterranean area.

One plan for a transatlantic system known as the North Atlantic Relay Communications System, or NARCOM, has been developed. This system, as conceived by Unitel, Inc., a New York telecommunications and planning firm, envisages relay stations at 250-300 mile intervals crossing Newfoundland, Iceland, Greenland, and then on to England and the Continent—heliocopters would supply the two or three stations perched atop the Greenland ice cap. While technically feasible, the cost of building such an elaborate microwave relay network is at present prohibitive. Language barriers, time differentials, and varying national TV standards multiply the difficulties involved in telecasting across so many miles.

MORE PROBABLE in the near future is a less ambitious form of international television. With TV stations in 32 nations on five continents, the demand is growing for greater variety and improved quality in programming. Expanded international exchange of television film may partially answer the need.

The exchange idea is not new, but its use is spreading. The Voice of America now sends six weekly programs, ranging from a concert series to a documentary on the peacetime uses of atomic energy, to TV stations in 19 countries. Our leading networks export and sell film strips of their own popular commercial shows. And most recently, a long step forward in international television cooperation took place when the Educational Television and Radio Center at Ann Arbor contracted with the British Broadcasting Corporation for a series of films on British art to be produced in England by BBC. ◄◄

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### Future of Underdeveloped Countries

Economic Development in underdeveloped areas, says Eugene Staley in "The Future of Underdeveloped Countries," will not automatically guarantee political democracy and peace. History proves, as in the case of Germany and Japan before 1945 and Russia today, that technological advances can just as easily promote totalitarianism and aggression. Yet if Western civilization is to survive and prosper, says Mr. Staley who is Senior Economist at the Stanford Research Institute, economic development must be based on human dignity and democratic principles.

In his book, published for the Council on Foreign Relations, the author examines the views of underdeveloped countries, the U.S., and the world community toward economic development; analyzes Communist techniques and plans for winning over Asia, Africa, and Latin America; and concludes with a detailed consideration of Free World policies that are necessary to avert Communist domination of these regions. The political implications of economic development are stressed throughout. (From: Council on Foreign Relations, 58 E. 68 St., N.Y. 21. 1954. 403 pp. $5)

## Foreign Exchange Problems

In its latest research study The Twentieth Century Fund characterizes postwar exchange control systems and international payments arrangements as a "monstrously complex network...which has minimized the role of market forces in determining what nations will produce and what they will sell to one another." Such trade discrimination and exchange restrictions, says Raymond F. Mikesell, University of Virginia Economics Professor and author of the study, hamper the Free World in its competition with the Soviet bloc for a higher rate of economic growth. What is needed, concludes the author, is a payments mechanism which will permit the "operation of unfettered markets for goods and capital." Broad conclusions relevant to developing such a mechanism are outlined at the end of the study. ("Foreign Exchange in the Postwar World." From: The Twentieth Century Fund, 330 W. 42 St., N. Y. 36. 1954. 658 pp. $5) ◄

## Opportunities for Economic Expansion

CHANGES in public and private policies to encourage greater use of the country's manpower and steadily rising productive capacity were recommended in a report, "Opportunities for Economic Expansion," released by the NPA Steering Committee in July. Production of goods and services should be stepped up by an annual rate of about $25 billion over a period of a year, the Committee said, if our economic activity is not to remain below the growing potential of production.

The Committee, while recognizing the difficulty of determining the best types of economic expansion under present conditions, feels that "in an unsettled world situation with an ever present war threat, it is the most realistic course of action to develop and maintain a well-balanced program of preparedness and at the same time to promote the growth of economic strength and a rise in living standards both here and in the rest of the free world. With full utilization of our resources and careful planning of policies these objectives can be obtained. There is only one thing which we cannot afford; that is to permit labor and capacity to remain idle."

If "there is no urgent need to adopt at this time additional national security programs of substantial magnitude," the Committee suggests that "additional measures should be considered to promote expansion and 'maximum employment, production, and purchasing power' in accordance with the requirements of the Employment Act."

The Committee recommends consideration of further tax measures to strengthen consumer purchasing power; provisions for better coordination and a step-up in urgent nondefense programs of the Federal, state, and local governments; amendments to the housing program; and more study of price and wage policies which are consistent with and support both continued high employment and general price stability. (PP—87. July 1954. 25 pp. 50¢ — Free to NPA members.)

### ∫ *Editorial Comment* ∫

Reaction of the press to NPA's report, "Opportunities for Economic Expansion," (released on July 4), reflects an interestingly wide range of views on the subject, as the following excerpts from editorials and columns indicate:

"This generally encouraging /employment/ picture, however, must be viewed within a long-term frame. Last week the National Planning Association reminded the country that if the present rate of economic activity is maintained, a $25-billion gap would develop between actual production figures and the hypothetical figures which would be required for full employment....

"The only alternatives seen by this distinguished group of business men and economists were increased defense spending, which might have to be authorized by a special session of Congress next fall, or additional governmental measures to allow the economy to expand to full employment levels. This view of things seems to be shared by Arthur F. Burns, the President's chief economic adviser, who remarked a month ago that unemployment figures of more than 3 million were 'definitely intolerable,' and that if business should 'bump along' at June levels for another five or six months, 'early government action would be called for.' " — N. Y. Herald Tribune.

"If we buy the National Planning Assn.'s 'plan,' can the final result be guaranteed? There are grave dangers inherent in a superboom—in making the economy operate under forced draft everyday of every month of every year. High cost production is inevitable with

a resulting lower standard of living."— Lawrence Fertig in the N. Y. World-Telegram.

"But a recent report by the steering Committee of the National Planning Association places considerably less emphasis on the view that inventory liquidation 'caused' the recession and that the trouble will be over if and when the inventory adjustment has been completed....The NPA committee believes that the basic adjustments needed to create additional purchasing power still have not been made." — Birmingham News.

"The NPA's report may lead the Administration's economists to re-examine their policies. But we doubt that NPA's prescription is what we need at present. Its program would stimulate the economy—but it might easily overstimulate and bring an inflationary situation.

"The real question, we suspect, is: How fast should the economy grow?" — Business Week. ◄◄

## NPA Committee Members

NPA welcomes the following new members of the Labor and Agriculture Committees:

Labor Committee:

Jacob Clayman — Secretary-Treasurer, Ohio CIO Council, Columbus, Ohio.

Michael Fox — President, Railway Employees' Department, AFL, Chicago.

J. B. S. Hardman — New York City.

Joseph D. Keenan — Secretary-Treasurer, Building and Construction Trades Department, AFL, Washington, D. C.

O. A. Knight — President, Oil Workers International Union, CIO, Denver.

John K. Meskimen — Director, Office of Labor Affairs, Foreign Operations Administration, Washington, D. C.

J. Scott Milne — International President, International Brotherhood of Electrical Workers, AFL, Washington, D. C.

Victor G. Reuther — Assistant to the President, CIO, Washington, D. C.

Harry Sayre — International President, United Paperworkers of America, CIO, Washington, D. C.

James A. Suffridge — International Secretary-Treasurer, Retail Clerks International Association, AFL, Washington, D. C.

Agriculture Committee:

John Wickham — President, New York State Vegetable Growers Association, Long Island, New York.

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